PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-063423

(43)Date of publication of application : 12.03.1993

(51)Int.Cl. H01Q 1/32

(21)Application number : 03-245127

(22)Date of filing : 30.08.1991

(71)Applicant : ASAHI GLASS CO LTD

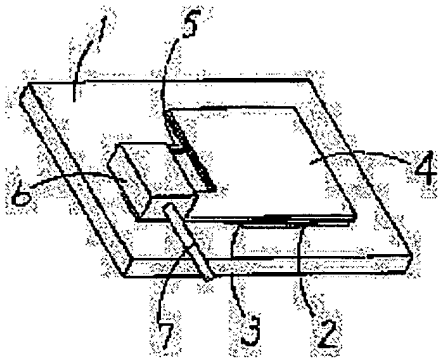
(72)Inventor : TERAJIMA FUMITAKA
IWAASA YUJI
SHIBATA KIYOSHI

(54) ON-VEHICLE PLANE ANTENNA

(57)Abstract:

PURPOSE: To easily manufacture a thin and light antenna capable of receiving a weak signal by forming each conductive layer and dielectric layer with a thick film.

CONSTITUTION: On an on-vehicle window plate 1, a conductive layer for radiation element, a dielectric layer 3, a grounding conductive layer 4 are provided in the order. An input terminal and the conductive layer 2 for radiation element of an amplifier 6 provided near the window plate 1 are connected. The grounding electrodes of an amplifier 6 and the grounding conductive layer 4 are connected. The Ag paste of the conductive layer 2 for radiation element, grounding conductive layer, and a feeder 5 is formed by thick film printing, and the dielectric layer 3 is formed by a thick film using the dielectric including at least one of the dielectric among glass, resin, and ceramics or the like. Therefore, the thickness of the micro strip antenna, that is, the total thickness of the conductive layer 2 for radiation element, the dielectric layer 3, and the grounding conductive layer 4 can be less than several hundreds of μm. Thus, the device can be made light in weight without deteriorating the design in the case it is formed on the window plate 1 on the vehicle opening part.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The flat antenna for mount characterized by having connected the input edge of amplifier and this conductor layer for radiating elements on the windowpane board of a car which prepared the lower shell, the conductor layer for radiating elements, the dielectric layer, and the grounding conductor layer in this order in part at least, and were allotted near [on this windowpane board], and connecting the grounding electrode and the above-mentioned grounding conductor layer of this amplifier.
[Claim 2] On the windowpane board of a car, in part at least A lower shell, the conductor layer for radiating elements, The 1st dielectric layer, a grounding conductor layer, the 2nd dielectric layer, and a feeder are formed in this order. The hole prepared in this 1st dielectric layer, this grounding conductor layer, and this 2nd dielectric layer is made to penetrate the conductor for connecting the above-mentioned feeder with the above-mentioned conductor layer for radiating elements. Furthermore, the flat antenna for mount characterized by having connected the input edge of the amplifier arranged near [on this feeder and the above-mentioned windowpane board], and connecting the grounding electrode and the above-mentioned grounding conductor layer of this amplifier.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to the flat antenna for mount.
[0002]
[Description of the Prior Art] Conventionally, the micro-stripe antenna for cars which constituted the micro-stripe antenna in a shell plate and one as a dielectric substrate using a part for the dielectric soma of a car shell plate is proposed by JP,61-290803,A.
[0003] However, in order to receive certainly the feeble signal transmitted from a GPS satellite, it is indispensable to install amplifier near the antenna. Moreover, it is desirable to install an antenna and amplifier in the vehicle interior of a room with little change of natural environment. Furthermore, the hole for electric supply is needed for a car shell plate. The aforementioned official report of the above-mentioned point was inadequate.
[0004]
[Problem(s) to be Solved by the Invention] The purpose of this invention cancels the above-mentioned fault which the conventional technology had, and aims at offering newly the above-mentioned technology which was not known further conventionally. That is, a feeble signal can be received certainly, an antenna and amplifier can be installed in the vehicle interior of a room with little change of natural environment, and it aims at offering the flat antenna for mount of the thin shape which does not need perforation processing for a car shell plate.
[0005]
[Means for Solving the Problem] this invention is made that the above-mentioned technical problem should be solved. in part at least on the windowpane board of a car A lower shell, Prepare the conductor layer for radiating elements, a dielectric layer, and a grounding conductor layer in this order, and the input edge of amplifier and this conductor layer for radiating elements which were allotted near [on this windowpane board] are connected. The flat antenna for mount characterized by connecting the grounding electrode and the above-mentioned grounding conductor layer of this amplifier, On the windowpane board of a car, in part at least And a lower shell, the conductor layer for radiating elements, The 1st dielectric layer, a grounding conductor layer, the 2nd dielectric layer, and a feeder are formed in this order. The hole prepared in this 1st dielectric layer, this grounding conductor layer, and this 2nd dielectric layer is made to penetrate the conductor for connecting the above-mentioned feeder with the above-mentioned conductor layer for radiating elements. Furthermore, the flat antenna for mount characterized by having connected the input edge of the amplifier arranged near [on this feeder and the above-mentioned windowpane board], and connecting the grounding electrode and the above-mentioned grounding conductor layer of this amplifier is offered.
[0006]
[Example] Hereafter, an example is explained according to a drawing.
[0007] The windowpane board with which it is the perspective diagram of the flat antenna for mount of a [example 1] this example, and 1 was prepared in car opening, The grounding conductor layer to which the conductor layer for radiating elements and 3 are connected [a dielectric layer and 4] for 2 as electrically [the part] as the outer conductor of a coaxial cable 7, and the grounding electrode of amplifier 6, 5 is a feeder which connects the input edge of amplifier 6 to the conductor layer 2 for radiating elements, and a coaxial cable 7 has the function to tie the receiver currently installed apart from the outgoing end of amplifier 6.
[0008] Although the conductor layer 2 for radiating elements, the grounding conductor layer 4, and the feeder 5 formed Ag paste by thick film screen printing, and it calcinated at about 550 degrees C after drying, it is not limited to this but the plate of Ag-Pd, Pd, Cu paste, or a metal may be pasted up with adhesives etc.
[0009] Moreover, it forms by the thick film using the dielectric containing at least one of dielectrics, such as glass, a resin, and ceramics, or a dielectric layer 3 can paste up the thing of the shape of the shape of a plate and a sheet, and a

film with adhesives etc. When the glass frit which can be calcinated at about 550 degrees C is used, the aforementioned Ag paste and simultaneous baking are attained and a manufacture process can be improved.

[0010] Total of the thickness of the thickness 2 of the micro-stripe antenna produced like the above, i.e., the conductor layer for radiating elements, a dielectric layer 3, and the grounding conductor layer 4 can be made hundreds of micrometers or less, even when it forms on the windowpane board formed in car opening, does not spoil design nature and also has the advantage of being lightweight.

[0011] Even if not only a rectangle but the configuration of the conductor layer 2 for radiating elements, a dielectric layer 3, and the grounding conductor layer 4 is circular, a filament is sufficient as it. Moreover, in drawing 1 , it may consider as the plate of an insulator different from the windowpane board in which the windowpane board 1 was formed by car opening, and the glass side in which this was prepared by car opening may be pasted by the method of adhesives etc.

[0012] [Example 2] drawing 2 is the perspective diagram of the flat antenna for mount of an example 2, 21 is the 1st dielectric layer formed between the conductor layer 2 for radiating elements, and the grounding conductor layer 4, and 22 is the grounding conductor layer 4 and the 2nd dielectric layer formed between feeders 5.

[0013] The hole is prepared in the predetermined position of the 1st, the 2nd dielectric layer 21 and 22, and the grounding conductor layer 4, this hole is made to penetrate a conductor, the end of a feeder 5 is electrically connected with the conductor layer 2 for radiating elements, and the feeder 5 is connected with the input edge of amplifier 6. A part of grounding conductor layer 4 and 2nd dielectric layer 22 are extended to near the input edge of the amplifier 6 installed in near, and since the feeder 5 formed on the 2nd dielectric layer 22 is a microstrip line with a predetermined impedance, the few connection of a loss of it is attained.

[0014] In addition, when a feeder is made microstrip-line composition, perforation processing for electric supply in a back process etc. becomes unnecessary by carrying out the stratification using a board with which a part of dielectric layer 21 and 22 and grounding conductor layer 4 serve as a hole.

[0015]

[Effect of the Invention] It is possible to receive certainly the feeble signal transmitted from a GPS satellite by this invention, and it is possible by making each conductor layer and a dielectric layer form by the thick film to manufacture a lightweight antenna simple with a thin shape. Furthermore, when the 2nd dielectric layer is prepared on a grounding conductor layer and a feeder is constituted from a microstrip line, it is possible even for the amplifier installed in near to transmit an input signal by the low loss.

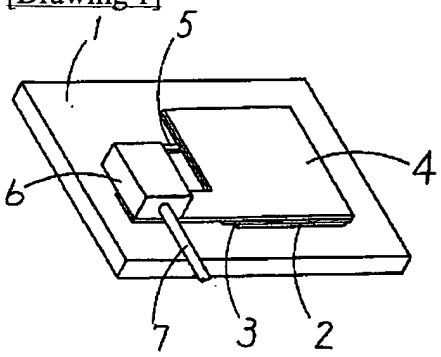
[0016] Since it has the composition that the flat antenna for mount of this invention can be installed in the vehicle interior of a room, operation is stabilized and the effect of having high reliability is also accepted.

[Translation done.]

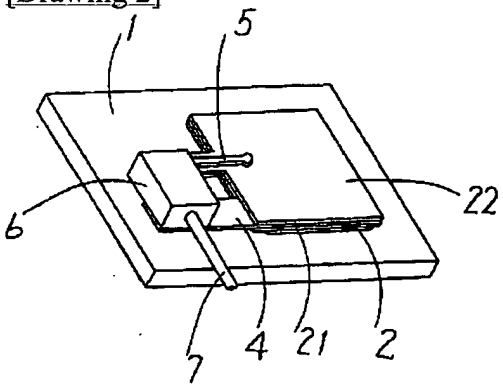
* NOTICES *

DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]